REMARKS

Claims 1-14 are pending in the application. Claims 1-9 have been amended. Claims 10-14 have been added. No new matter has been added.

Claims 1, 2, 4, 5 and 7 stand rejected under 35 U.S.C. § 103 as being unpatentable over U.S. Patent No. 6,219,030 to Nonomura et al. in view of U.S. Patent No. 5,625,410 to Washino et al.

The present invention relates to a method and device for compressing and processing multi-screen digital video signals comprising the steps of (a) scaling the resolutions of digital video signals depending on the even/odd field for compression or multi-screen processing, and (b) compressing or processing for multi-screens the scaled digital video signals. Further, the present invention relates to a device for compression and multi-screen process of digital video signals comprising multi-channel analog/digital converters (A/D converters), a compression FIFO, a multi-screen FIFO, a CPU, and a video processor.

Generally, A/D converters consume an extraordinary amount of current, a great amount of electric power and generate a significant amount of heat. Accordingly, one object of the present invention is to reduce the number of A/D converters required in the compression and multi-screen processes. As explained in the specification, conventional multi-channel DVR systems are expensive because N x 2 A/D converters are required. In the present invention, however, the video signals are scaled to have a first resolution for compression or to have a second resolution for multi-screen processing depending on even/odd fields of the signals. Further, the compression process and the multi-screen process are conducted sequentially depending on the even/odd fields. Therefore the present invention uses N A/D converters for the N channels.

Therefore, according to the present invention, the number of A/D converters is reduced, the power consumption is reduced and the stability of the system is enhanced. This structure and method for achieving this objective and the resulting benefits are not disclosed in Wahsino or Nonomura.

Independent claim 1 recites, *inter alia*, "[t]he method of compressing and processing for multi-screens a plurality of digital video signals on respective channels by multi-thread scaling, which uses a single integrated analog/digital converter for each channel, comprising: (a) scaling digital video signals outputted from analog/digital converters to have a first resolution for compression, or to have a second resolution for a multi-screen process depending on the even/odd fields of the input video signals; and (b) storing and compressing the scaled digital video signals of the first resolution, or storing and processing for multi-screens the scaled digital video signals of the second resolution."

Independent claim 7 recites, *inter alia*, "[a] device for compression and multi-screen processing of digital video signals by multi-thread scaling comprising: multi-channel analog/digital converters for generating even/odd field indicators based on input video signals and for converting and scaling the input video signals to have a first resolution for compression or to have a second resolution for a multi-screen process based on the even/odd field indicators; a compression FIFO for storing video signals scaled to have the first resolution outputted from the multi-channel analog/digital converters; a multi-screen FIFO for storing video signals scaled to have the second resolution outputted from the multi-channel analog/digital converters."

In the present invention, the video signals are scaled at different resolutions (i.e., a resolution for compression or a resolution for a multi-screen process) depending on whether the field is an even field or an odd field. Thus, the compression process and the multi-screen process are conducted sequentially depending on the even/odd field of

the signals. The device for conducting such method can be implemented, for example, as shown in Fig. 3 of the drawings of the present invention. As shown in Fig. 3 and explained in detail in the specification, the number of A/D converters can be reduced by half compared to the prior art. The reduction of A/D converters and the use of multi-thread scaling for compression or for processing is not disclosed or suggested in the cited references.

Nonomura does not teach or suggest all of the limitations of independent claims 1 and 7. Nonomura relates to a method and a device for displaying video data wherein character information is included in the 21st line of vertical blanking interval of odd fields. When the vertical blanking interval contains the character information, eight lines (14 through 21) at the head of the field are not scaled. The character information is transferred to a decoding apparatus for generation of character data. Meanwhile, other image information is scaled, transferred to a color format conversion unit and then displayed on the display device. Nonomura does not disclose or suggest compressing and processing multi-screen digital video signals by multi-thread scaling using a single integrated analog/digital converter for each channel. Further, Nonomura does not teach the use of multi-screen digital video signals. In Nonomura, the character information and the image data are processed differently. The video signals of Nonomura are only for storing or scaling to display, conversely, in the present invention video signals are scaled as a resolution for compression or processing. Accordingly, Nonomura does not teach all of the limitations of independent claims 1 and 7. Furthermore, Washino fails to overcome these inadequacies of Nonomura.

Washino relates to a PC-based system for monitoring and storing representative images from video cameras. In Washino, multiple video signals are displayed on the screen. Washino fails, however, to teach scaling for compressing and processing of

multi-screens digital video signals by multi-thread scaling, based on the odd/even indicators, using a single A/D for each channel.

Thus, Washino and Nonomura, whether taken individually or in combination, do not teach or suggest a "method of compressing and processing for multi-screens a plurality of digital video signals on respective channels by multi-thread scaling, which uses a single integrated analog/digital converter for each channel, comprising: (a) scaling digital video signals outputted from analog/digital converters to have a first resolution for compression, or to have a second resolution for a multi-screen process depending on the even/odd fields of the input video signals" as recited in independent claim 1. Washino and Nonomura also do not teach or suggest "[a] device for compression and multi-screen processing of digital video signals by multi-thread scaling comprising: multi-channel analog/digital converters for generating even/odd field indicators based on input video signals and for converting and scaling the input video signals to have a first resolution for compression or to have a second resolution for a multi-screen process based on the even/odd field indicators; a compression FIFO for storing video signals scaled to have the first resolution outputted from the multi-channel analog/digital converters" as recited in independent claim 7.

As the examiner pointed out, Washino notes that the object of the invention described therein is to provide a more efficient method for monitoring camera outputs. However, neither Washino nor Nonomura disclose or suggest providing the method and device of the present invention. "The mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination." M.P.E.P. § 2143 (emphasis added). There is no suggestion to combine the references to attain the claimed invention.

Since Washino and Nonomura do not teach or suggest all of the limitations of claims 1 and 7, in addition to the lack of suggestion or motivation to combine the

references, claims 1 and 7 are not obvious over the cited references. Claims 2-6 depend from claim 7 and are patentable at least for the reasons mentioned above. Claims 8-9 depend from claim 7 and are patentable at least for the reasons mentioned above.

Claim 3 stands rejected under 35 U.S.C. § 103 as being unpatentable over U.S. Patent No. 6,219,030 to Nonomura et al. in view of U.S. Patent No. 5,625,410 to Washino et al. further in view of U.S. Patent No. 5,881,205 to Andrew et al.

Claim 6 stands rejected under 35 U.S.C. § 103 as being unpatentable over U.S. Patent No. 6,219,030 to Nonomura et al. in view of U.S. Patent No. 5,625,410 to Washino et al. further in view of U.S. Patent No. 5,648,792 to Sato et al.

Claims 8 and 9 stand rejected under 35 U.S.C. § 103 as being unpatentable over U.S. Patent No. 6,219,030 to Nonomura et al. in view of U.S. Patent No. 5,625,410 to Washino et al. further in view of U.S. Patent No. 5,881,205 to Andrew et al. and U.S. Patent No. 5,648,792 to Sato et al.

Claims 3 and 6 depend from claim 1 and are allowable along with amended claim 1 for at least the reasons set forth above. Claims 8-9 depend from claim 7 and are allowable along with amended claim 7 for at least the reasons set forth above. Applicant respectfully requests that the 35 U.S.C. § 103 rejection of claims 1-9 be withdrawn.

New claims 10-14 have been added. The subject matter of these new claims is also not taught or suggest by the references of record.

In view of the above, each of the presently pending claims in this application is believed to be in immediate condition for allowance. Accordingly, the Examiner is respectfully requested to pass this application to issue.

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Respectfully submitted,

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